

REMARKS

Reconsideration is requested.

Claim 32 has been revised, without prejudice, to include the details of the specification, such as are described for example on page 8, line 27 to page 9, line 1, and page 65, line 7 to page 66, line 11.

Claims 32-61 are pending. Claims 58 and 59 have been withdrawn from consideration. Rejoinder and allowance of the withdrawn subject matter are requested.

The Section 112, second paragraph, rejection of claims 55-57 is obviated by the above amendments. The claims are submitted to be definite. Withdrawal of the Section 112, second paragraph, rejection of claims 55-57 is requested.

The Section 102 rejection of claims 32 and 60 over Matsui (U.S. Patent Application No. 2004-0074531) is traversed. Reconsideration and withdrawal of the rejection are requested as U.S. Patent Application No. 2004-0074531, which was published April 22, 2004, is not citable against the present application, which claims benefit of priority applications filed January 20, 2004 and April 15, 2004. U.S. Patent Application No. 2004-0074531 is a U.S. national phase of international application PCT/JP01/011381, which was filed and published¹ in Japanese. U.S. Patent Application No. 2004-0074531 is not citable as a reference before the April 22, 2004 publication of same. See MPEP § 706.02(f)(1). Withdrawal of the Section 102 rejection

¹ The international application published as WO2002052654 on July 4, 2002. The WO publication is citable against the present application as having been published more than a year before the U.S. filing date of the present application. WO2002052654 is of record and has been considered by the Examiner.

of claims 32 and 60 over Matsui (U.S. Patent Application No. 2004-0074531) is requested.

To the extent the Examiner may rely on WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531) to reject the claims, the applicants note that WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531) fails to teach each and every aspect of the claimed invention. Specifically, Matsui describes a series of photoelectric conversion elements in a solar cell wherein a semiconductor layer is, in each successive element, on the light receiving side of an electrolyte layer of the photoelectric conversion elements. The solar cell module of the claimed invention however requires, at a minimum, second photoelectric conversion elements containing a porous photoelectric conversion layer on a non-light receiving side of an electrolytic layer of the second photoelectric conversion elements. Moreover, there is no teaching or suggestion in Matsui of the presently claimed relationship between the electric current provided by the first and second photoelectric conversion elements.

The applicants submit that when light is incident only from one substrate side of the sensitized solar cell module of Matsui, the incident light amount to the porous photoelectric conversion layer of the second photoelectric conversion layer is lower than that to the porous photoelectric conversion layer of the first photoelectric conversion layer. As a result, the electric current amount of the second photoelectric conversion layer is lower than that of the first photoelectric conversion layer, so that the power from the lower electric current amount is outputted.

In contrast, the electric current amounts of the first and second photoelectric conversion elements of the claimed invention are the same so that the electric current amounts provide an effective power.

The claims are patentable over WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531).

The Section 103 rejection of claims 33, 34, 40-45 and 47-54 over Matsui (U.S. Patent Application No. 2004-0074531) and Chiba (U.S. Patent Application No. 2002/0134426) is traversed. Reconsideration and withdrawal of the rejection are requested as Matsui (U.S. Patent Application No. 2004-0074531) is not citable against the present application.

Moreover, the solar cell module of claims 33, 34, 40-45 and 47-54 would not have been obvious from the combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)) in view of Chiba as Chiba fails to cure the deficiencies noted above with regard to Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)). Specifically, while Chiba may describe

a dye-sensitized solar cell module and further discloses wherein first photoelectric conversion elements and second photoelectric conversion elements have semiconductor particles with different average particle diameters ([0011])²

there is no suggestion in the cited art to make a solar cell module of the claims containing second photoelectric conversion elements containing a porous photoelectric conversion layer on a non-light receiving side of an electrolytic layer of the second photoelectric conversion elements. Moreover, there is no teaching or suggestion in the

cited combination of art of a solar cell module of the claims requiring the claimed relationship between the electric current provided by the first and second photoelectric conversion elements and/or between the short circuit current of the first photoelectric conversion elements and the short circuit current of the second photoelectric conversion elements. In the presently claimed solar cell module the applicants have appreciated that in a plurality of dye-sensitized solar cells connected in series, the obtained short circuit is the short circuit current is controlled on the basis of the lowest short circuit current of the dye-sensitized solar cells. In requiring the short circuit current relationship of the claimed invention, the applicants have provided a solar cell module which is superior and would not have been expected from the cited combination of art.

The cited combination of art fails to teach or suggest the solar cell modules of the rejected claims. The solar cell modules of the claims are patentable over WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531) and Chiba.

The Section 103 rejection of claims 35 and 36 over Matsui (U.S. Patent Application Publication No. 2004/0074531) in view of Enomoto (JP2003-333757 (as translated by U.S. Patent Application Publication No. 2005/0268957), and Zeban ("relative Energetics at the Semiconductor/Sensitizing Dye/Electrolyte Interface) J. Phys Chem B. 1998, 102, 452-460) is traversed. Reconsideration and withdrawal of the rejection are requested as Matsui (U.S. Patent Application No. 2004-0074531) is not citable against the present application.

² See page 6 of the Office Action dated October 27, 2010.

Moreover, the solar cell module of claims 35 and 36 would not have been obvious from the combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)) in view of Enomoto (JP2003-333757 (as translated by U.S. Patent Application Publication No. 2005/0268957)), and Zeban, as the secondary references fail to cure the deficiencies noted above with regard to Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)).

Specifically, there is no suggestion in Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)) to have made a solar cell module with the characteristics of the rejected claims. The Examiner states that Matsui “does not explicitly disclose ... [a solar cell module of the claims]... wherein the iodine concentration in the electrolytic layers of the second photoelectric conversion elements is lower than the iodine concentration in the electrolytic layers of the first photoelectric conversion elements.” See page 13 of the Office Action dated October 27, 2010. Not only does Matsui not “explicitly disclose” the recited feature, the cited combination of references fail to suggest the claimed invention wherein the first photoelectric conversion elements and the second photoelectric conversion elements contain iodine in the respective electrolytic layers and the iodine concentration in the electrolytic layers of the second photoelectric conversion elements is lower than the iodine concentration in the electrolytic layers of the first photoelectric conversion elements.

In the event a rejection based on Enomoto is maintained, the Examiner is requested to clarify reliance on same as the discussion of the rejection on pages 13-15

of the Office Action dated October 27, 2010 is not believed to contain a reference to same.

The cited combination of art fails to teach or suggest the solar cell modules of the rejected claims. The solar cell modules of the claims are patentable over WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531), Enomoto (JP2003-333757 (as translated by U.S. Patent Application Publication No. 2005/0268957), and Zeban.

The Section 103 rejection of claims 37 and 38 over Matsui (U.S. Patent Application Publication No. 2004/0074531) in view of Zeban ("relative Energetics at the Semiconductor/Sensitizing Dye/Electrolyte Interface) J. Phys Chem B. 1998, 102, 452-460) is traversed. Reconsideration and withdrawal of the rejection are requested as Matsui (U.S. Patent Application No. 2004-0074531) is not citable against the present application.

Moreover, the solar cell module of claims 37 and 38 would not have been obvious from the combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)) in view of Zeban, as the secondary reference fails to cure the deficiencies noted above with regard to Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)).

The solar cell module of dependent claims 37 and 38 require the first photoelectric conversion elements and the second photoelectric conversion elements respectively to contain imidazoles or imidazolium salts in their electrolytic layers, the imidazole or imidazolium salt contained in each of the electrolytic layers of the first

photoelectric conversion elements being different from that contained in each of the electrolytic layers of the second photoelectric conversion elements. As the rejected claims are dependent from independent claim 32 however, the rejected claims also define a solar cell module that requires, at a minimum, first and second photoelectric conversion elements that provide the same amount of electric currents. The requirements of the rejected dependent claims would not have been obvious from the cited combination of art.

In *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415 (2007), the Supreme Court emphasized “an expansive and flexible approach” to the obviousness question. Nonetheless, the Court reaffirmed that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.*, at 418. The Court stated “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does ... because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known. *Id.*, at 418-419.

The solar cell modules defined by claims 37 and 38 would not have been obvious in view of the combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)) and Zeban.

The Section 103 rejection of claim 39 over Matsui (U.S. Patent Application No. 2004-0074531), Zeban and Chiba is traversed. Reconsideration and withdrawal of the

rejection are requested as Matsui (U.S. Patent Application No. 2004-0074531) is not citable against the present application.

Moreover, the solar cell module of claim 39 would not have been obvious from the combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)), Zeban and Chiba, as the secondary references fail to cure the deficiencies noted above with regard to Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)). The solar cell module of dependent claims 39 is patentable over the noted combination of art for reasons similar to those noted above with regard to the patentability dependent claims 33, 34, 40-45 and 47-54 over Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)), and Chiba. The Examiner's explanation of the rejection on pages 17-18 of the Office Action dated October 27, 2010 fails to describe the basis of the reliance on Zeban in rejecting the claims. Clarification of same is requested in the event a rejection based on a combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)), Zeban and Chiba is asserted.

The Section 103 rejection of claim 46 over Matsui (U.S. Patent Application No. 2004-0074531), Chiba and Wanlass (U.S. Patent No. 5,322,572) is traversed. Reconsideration and withdrawal of the rejection are requested as Matsui (U.S. Patent Application No. 2004-0074531) is not citable against the present application.

Moreover, the solar cell module of claim 46 would not have been obvious from the combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)), Chiba and Wanlass, as the secondary references fail to cure the

deficiencies noted above with regard to Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)). The solar cell module of dependent claims 46 is patentable over the noted combination of art for reasons similar to those noted above with regard to the patentability dependent claims 33, 34, 40-45 and 47-54 over Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)), and Chiba. Claim 46 is dependent from dependent claim 44. The additional teaching of Wanlass, which is not believed to relate to dye-sensitized solar cell modules, fails to cure the deficiencies of the Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)), and Chiba as at least noted above.

The Section 103 rejection of claims 55-57 over Matsui (U.S. Patent Application No. 2004-0074531) and Lindquist (WO 99/63599) is traversed. Reconsideration and withdrawal of the rejection are requested as Matsui (U.S. Patent Application No. 2004-0074531) is not citable against the present application.

Moreover, the solar cell modules of claims 55-57 would not have been obvious from the combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)) and Lindquist as the secondary reference fail to cure the deficiencies noted above with regard to Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)). The solar cell modules of dependent claims 55-57 are patentable over the noted combination of art for reasons similar to those noted above with regard to the patentability dependent claims 33, 34, 40-45 and 47-54 over Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)). Claims 55-57 are dependent from dependent claim 32, which includes the

details of now-canceled claim 33. The additional teaching of Lindquist fails to cure the deficiencies of the Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)), as at least noted above.

The Section 103 rejection of claim 61 over Matsui (U.S. Patent Application No. 2004-0074531), Chiba, Nazeeruddin ("Investigation of Sensitizer Adsorption and the Influence of Protons on Current and Voltage of a Dye-Sensitized Nanocrystalline TiO₂ Solar Cell" J. Phys. Chem. B 2003,107, 8981-8987) and Gratzel ("Perspectives for Dye-sensitized Nanocrystalline Solar Cells" Prog. Photovolt. Res. Appl. 8, 171-185 (2000)) is traversed. Reconsideration and withdrawal of the rejection are requested as Matsui (U.S. Patent Application No. 2004-0074531) is not citable against the present application.

Moreover, the solar cell module of claim 61 would not have been obvious from the combination of Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)), Chiba, Nazeeruddin and Gratzel as the secondary reference fail to cure the deficiencies noted above with regard to Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)). The solar cell module of dependent claim 61 is patentable over the noted combination of art for reasons similar to those noted above with regard to the patentability dependent claims 33, 34, 40-45 and 47-54 over Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)) and Chiba. Claim 61 is dependent from dependent claim 48, which includes the details of now-canceled claim 33. The additional teachings of Nazeeruddin and

YAMANAKA et al
Appl. No. 10/586,648
Atty. Ref.: 900-558
Amendment
March 24, 2011

Gratzel fail to cure the deficiencies of the Matsui (WO2002052654 (as translated by U.S. Patent Application No. 2004-0074531)) and Chiba, as at least noted above.

The claims are submitted to be in condition for allowance and a Notice to that effect is requested. The Examiner is requested to contact the undersigned, preferably by telephone, in the event anything further is required.

Respectfully submitted,

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